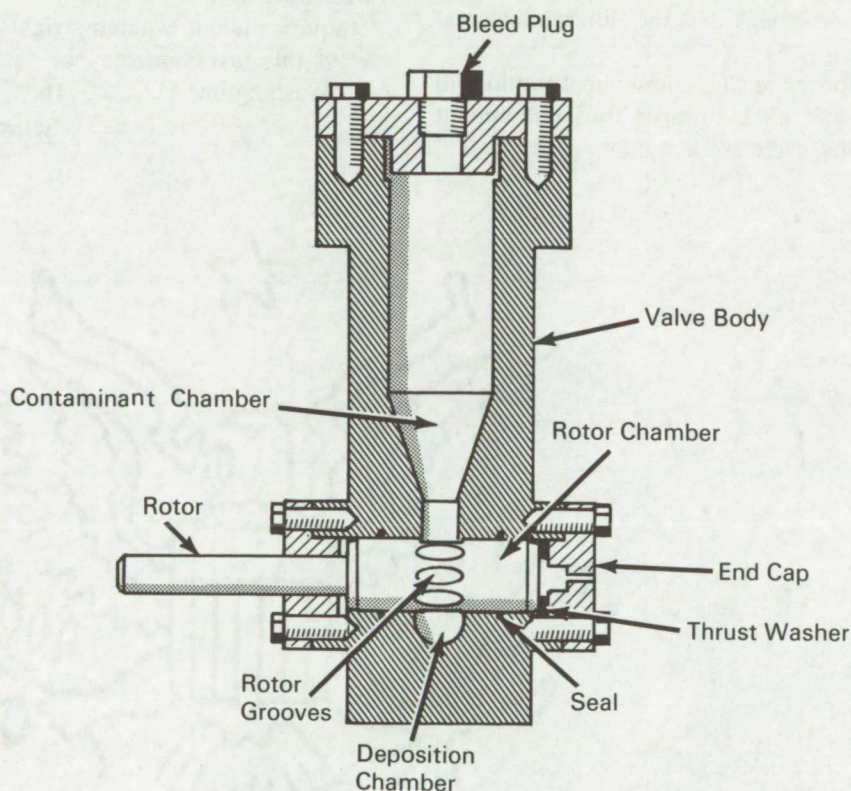


NASA TECH BRIEF



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Valve Effectively Controls Amount of Contaminant in Flow Stream



The problem:

To design a valve that uniformly deposits contaminant into a flow stream under full pressure and flow conditions. The valve will be used to test filters and filter elements of hydraulic oil, fuel, or lubricant systems. Prior art used slurry and dry contaminant depositions which were unsatisfactory because the operations were manually and unevenly controlled,

and required a variety of special equipment for different filter tests.

The solution:

A contaminant valve with a rotor on the periphery of which is a number of coaxial grooves. Measurable amounts of contaminant particles are carried to the deposition chamber from the contaminant chamber by the grooves in the rotor.

(continued overleaf)

How it's done:

The contaminant is manually deposited in the contaminant chamber. The chamber is filled with oil and pressurized. The trapped air is bled out. At the end of this preparatory phase, the contaminant particles float in the oil bath and, depending on their specific weight and other physical phenomena, tend to deposit in the exposed rotor grooves. Once rotation is induced, the rotor carries the contaminant particles and some oil down to the deposition chamber, where the fast flowing hydraulic oil impinges onto one groove after another. The particles are washed away and dispersed in the stream of flowing oil.

The number of depositions depends on the rotor speed and on the number of grooves in the rotor. The amount of contaminants in each deposition is a function of the groove size and the differential pressure across the rotor.

The emptied grooves in their subsequent motion fill with oil and carry it back towards the contaminant chamber, where the cycle starts again.

Notes:

1. Preliminary testing of the valve proved all the objectives of the design. The contaminant deposition, its uniformity and adjustability were recorded and interpreted very favorably. It was also established that large amounts of the contaminant could be loaded into the contaminant chamber without any detrimental effect on the performance.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B66-10683

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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(M-FS-1771)